

# Scratchbuilding a 10'0" Inside Height Emergency Box Car Side

Ted Culotta



Hindsight 20/20 9.0  
5 June 2021

This will be posted to [prototopics.blogspot.com](http://prototopics.blogspot.com)

# General References

While this presentation is intended to help with a specific project, I highly recommend consulting others' work to provide a foundation of thought. Good sources include the various scratchbuilding articles by Bob Hundman in *Mainline Modeler* (*MM*), the kitbashing articles by Mark Feddersen in *MM* and Richard Hendrickson in numerous publications, my material in *RMC* and the work of many in *Prototype Railroad Modeling*.

# References

- Drawings/Blueprints - archives and historical societies may have these, as well as many produced in publications, both model periodicals as well as industry publications (*Car Builder's Cyclopedia*, *Railway Age*, *Railway Mechanical Engineer*, etc.)
- Diagram sheets - historical societies as well as some private sellers offer reprints
- *Railway Prototype Cyclopedia* 19
- *Model Railroader*, June 1944
- *Mainline Modeler*, August 1994
- Photos
- Emergency Box Cars presentation from Hindsight 20/20 8.0 (linked at [prototopics.blogspot.com](http://prototopics.blogspot.com))

# The Subject: Pullman-Standard "Southeastern"\* Emergency Box Cars

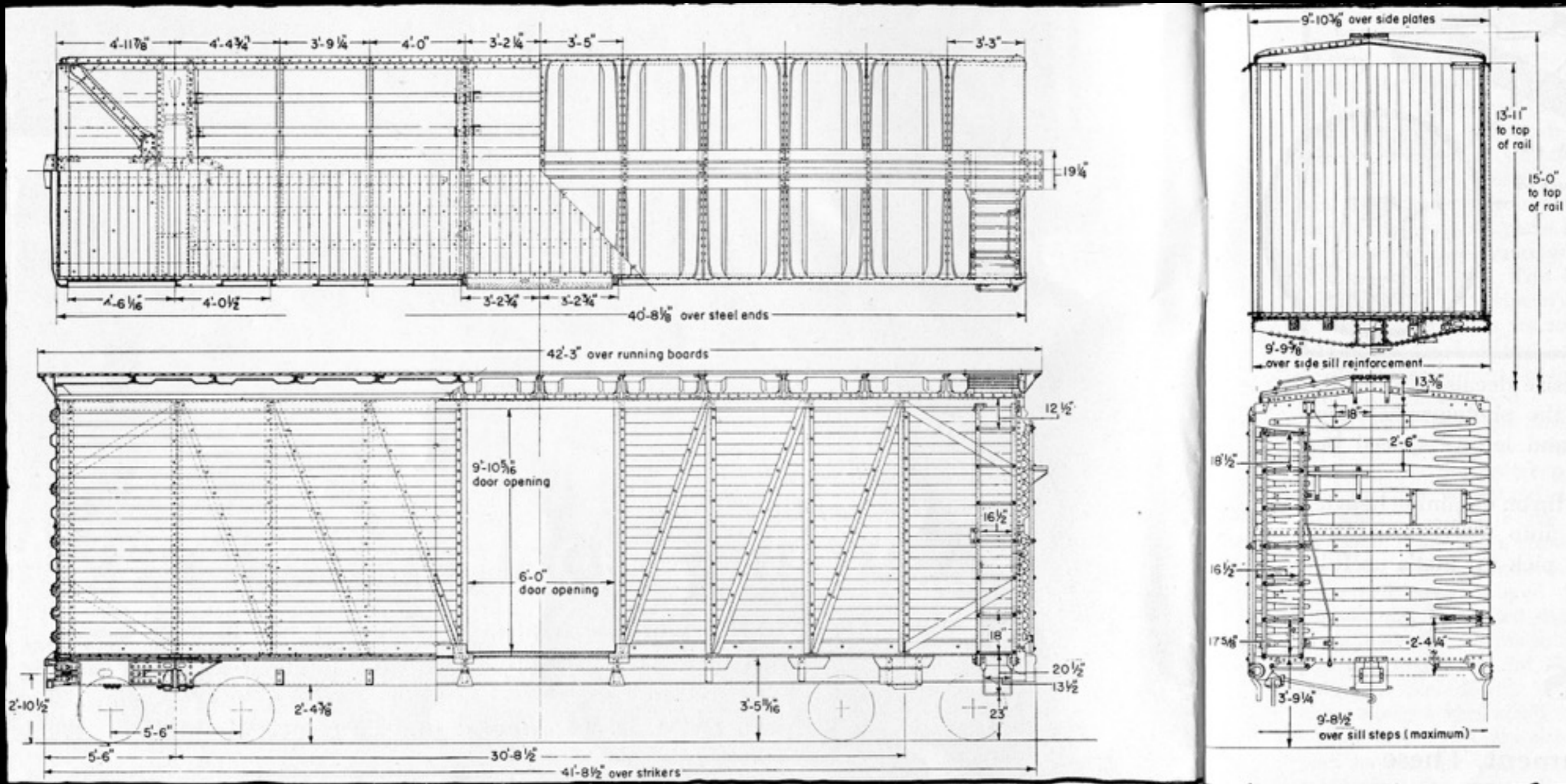
10'0" inside height cars



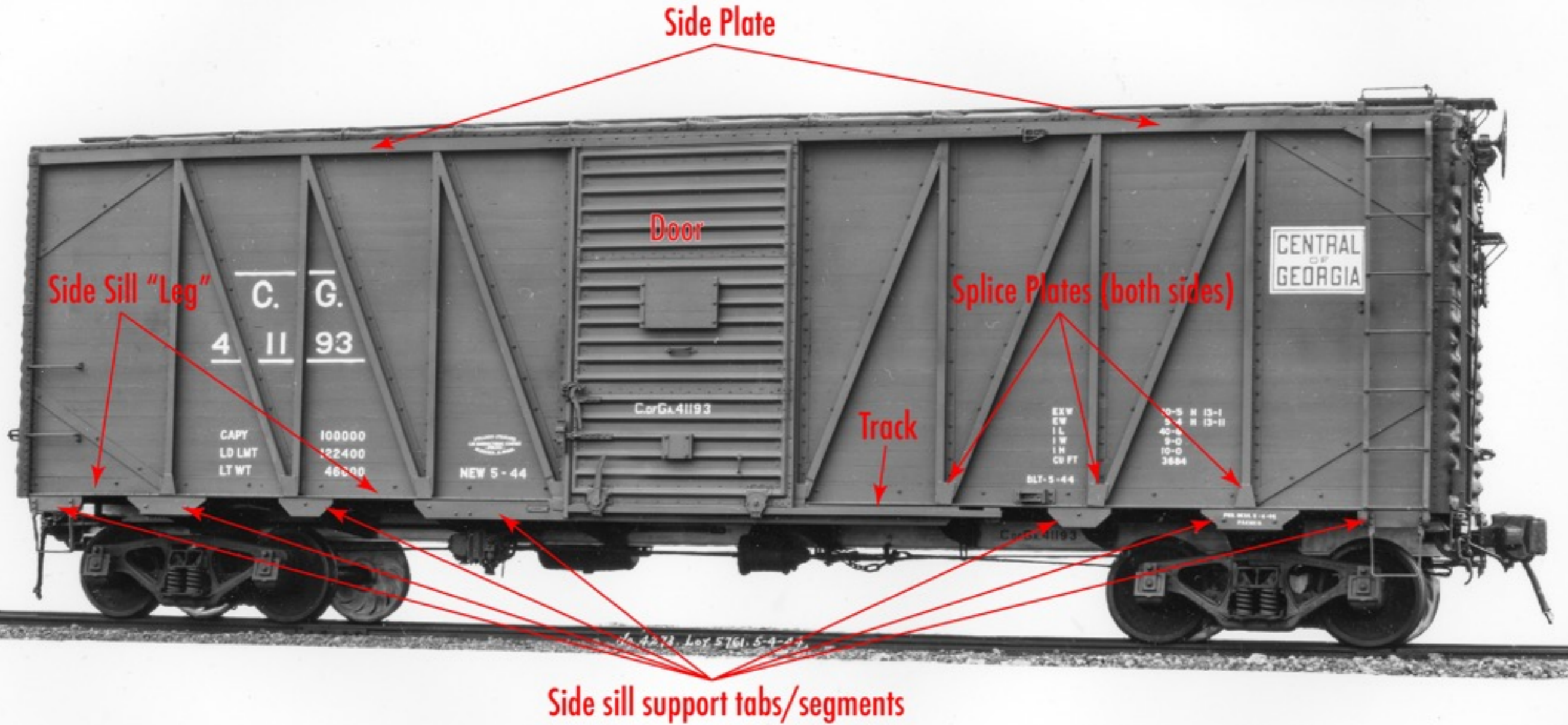
Haskell & Barker Collection, NMAH, Smithsonian

\* BS, CG (non-AC&F built cars), A&WP, WofA, GA

# The Subject: "Southeastern" Emergency Box Cars



# The Subject: Pullman-Standard "Southeastern" Emergency Box Cars A Few Considerations



Plus the donor model...

# Materials

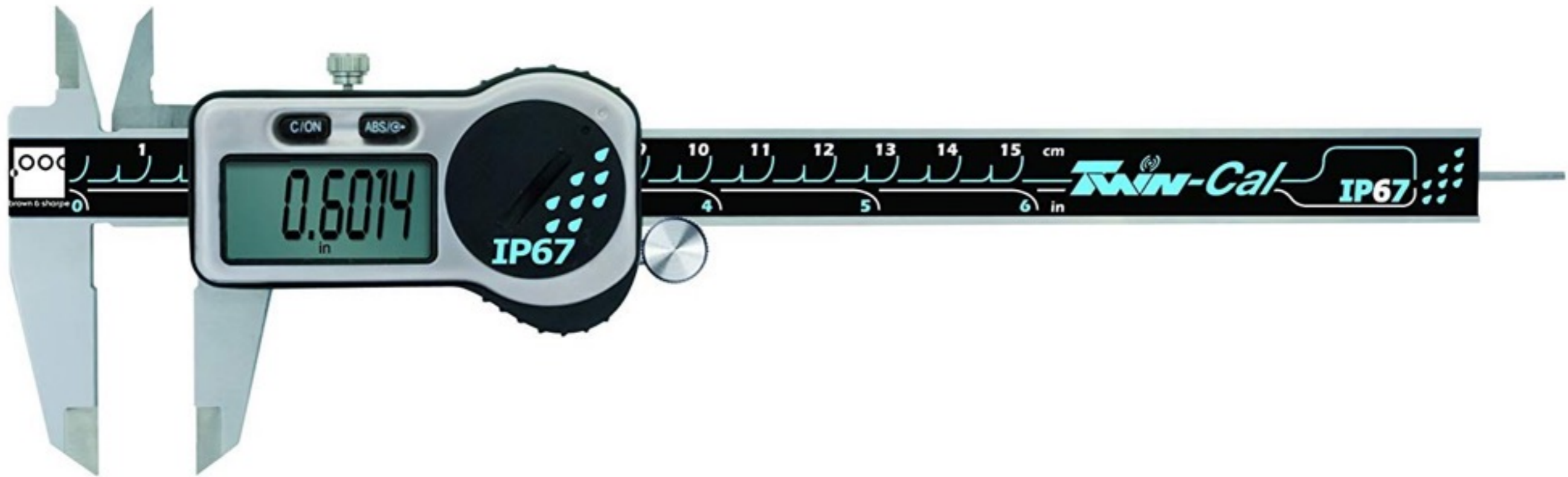
I prefer to use styrene as my primary material and augment it with shim stock vinyl and brass, as needed. That said, if you are more comfortable with wood, brass or some other material as your primary medium, then go with what works for you.

# Stuff to help...

- Tools (following pages)
- Adhesives
  - MEK (or your favorite solvent cement)
  - Barge Cement or Goo thinned with MEK for joining dissimilar materials
- Future floor wax — can be used a simple adhesive and to seal details for casting
- The usual
  - Files
  - Drills
  - Very, very fine brushes
  - Cutting tools, e.g. the ubiquitous no. 11 blade



# Calipers



- Don't get the least expensive; stainless jaws a must
- Measuring to 0.0001"
- Indispensable for laying out, locating, and spacing details such as structural members

# Squares



- Don't go cheap
- Starrett and Brown & Sharpe are excellent
- Indispensable for squaring components when pattern making

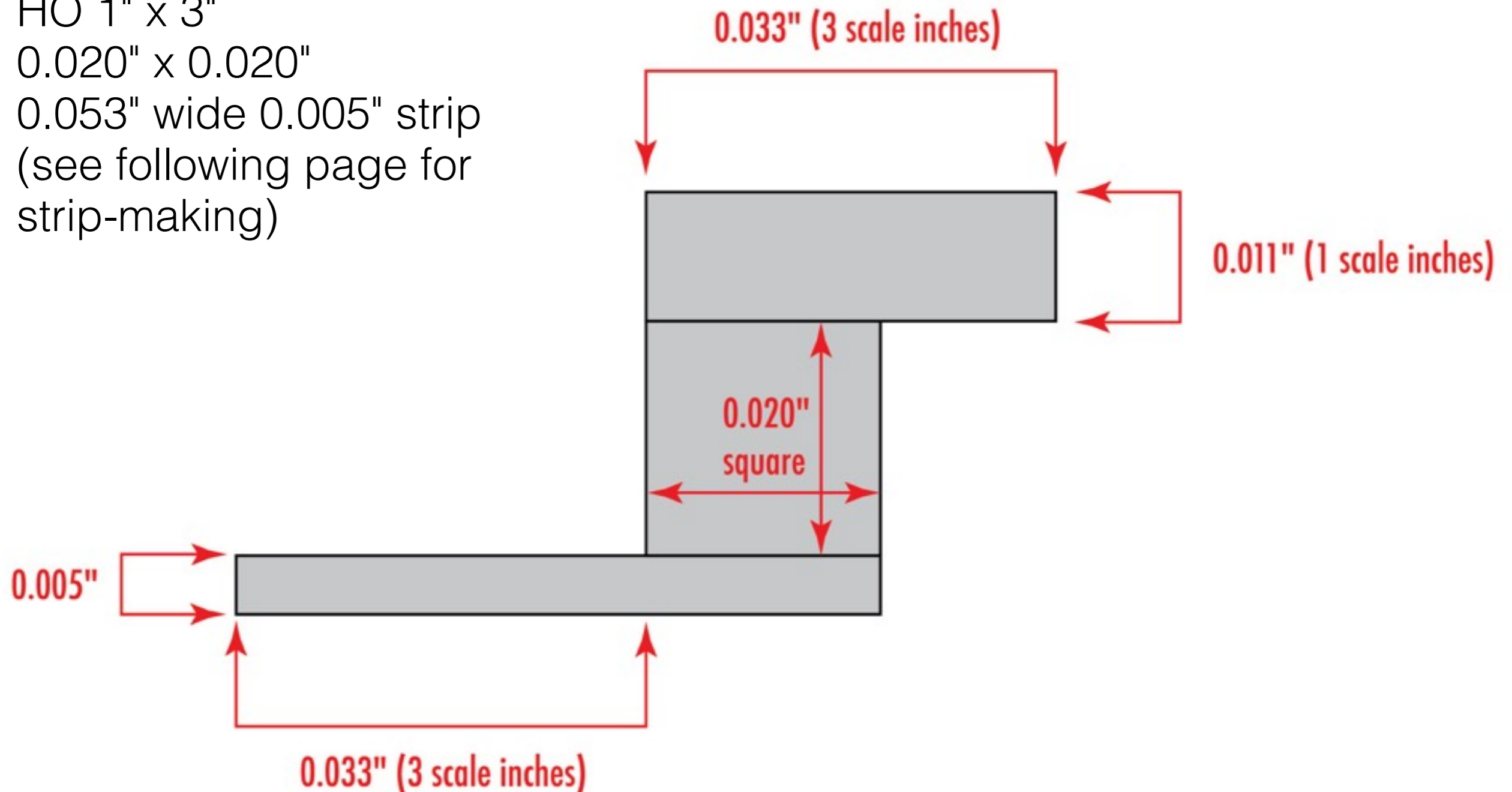
# Single Sheathed Cars

- Most boards in single sheathed cars are 5¼" wide, although 5⅛" is a common dimension for Emergency cars as well as 3¼" (ATSF Bx-38).
- 5⅛" wide = ~0.060" ; that is what we will cover herein
- I start with the thickest styrene sheet I can use, ⅛"
- Ensure that the edge is perfectly straight
- Side sills on "standard" Emergency box cars were 6" x ~3+" L-angles
- I use 0.060" for the basic side sills and 0.040" x 0.060" for the sheathing boards, except directly above the side sill
- Lay out the side sill keeping it straight relative to the edge of the styrene
- Then lay in the number of side sheathing boards needed
- The side plate "overlaps" the top of the car side, including the structural members
- The car side height is as close as possible to the prototype

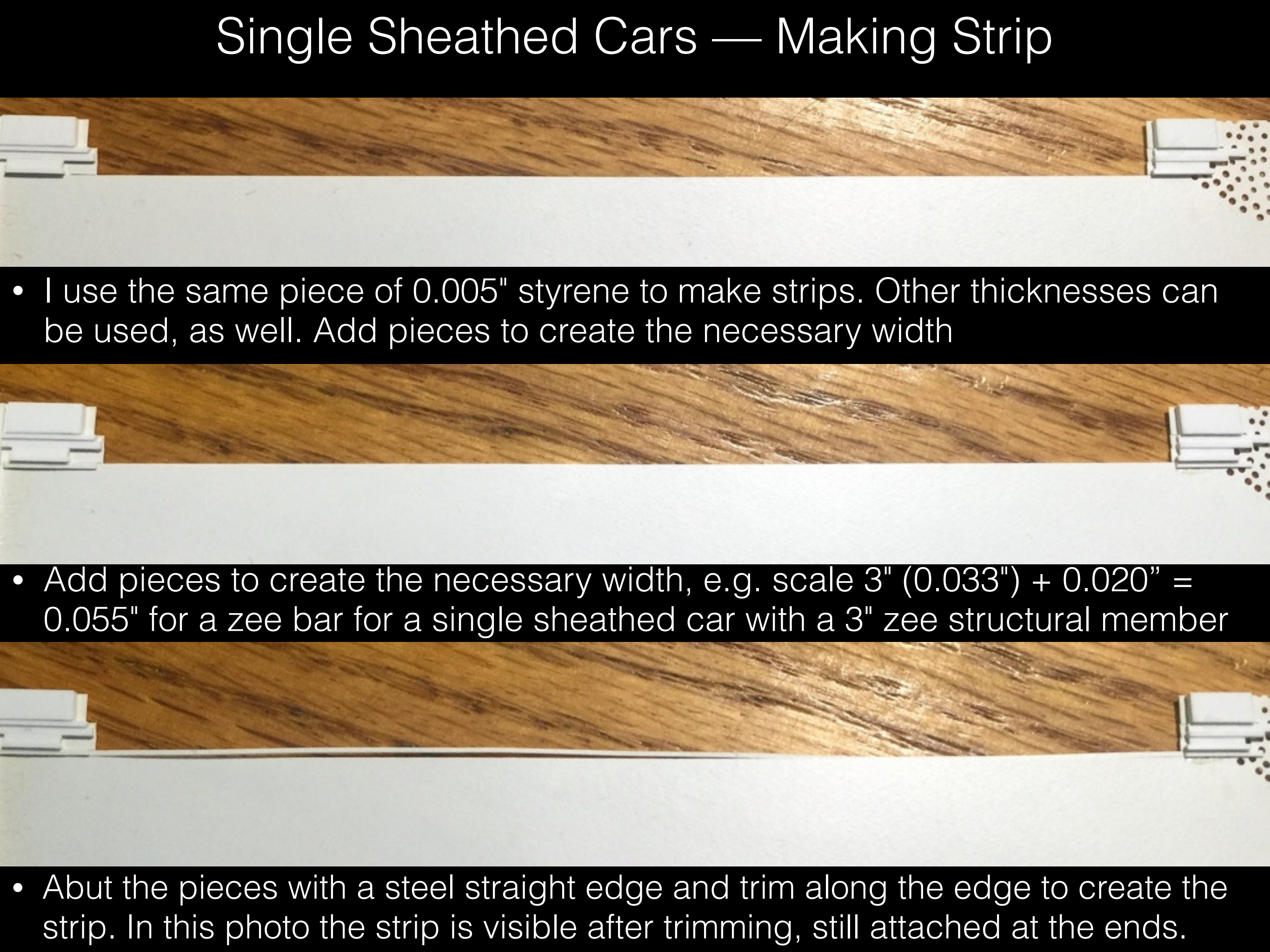
# Single Sheathed Cars

## Structure of a 3" Zee Bar

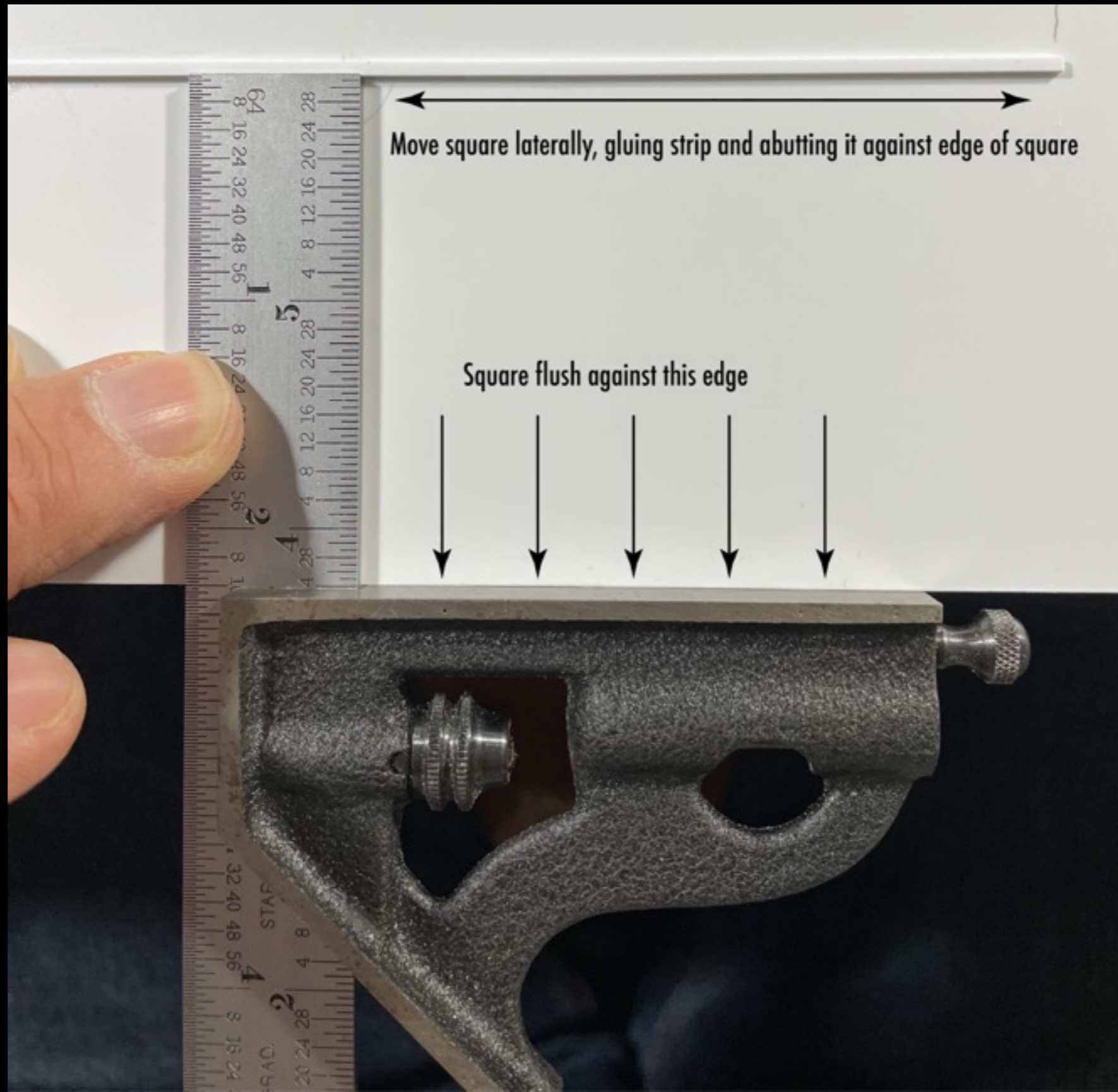
- HO 1" x 3"
- 0.020" x 0.020"
- 0.053" wide 0.005" strip (see following page for strip-making)



# Single Sheathed Cars — Making Strip

- 
- I use the same piece of 0.005" styrene to make strips. Other thicknesses can be used, as well. Add pieces to create the necessary width
  - Add pieces to create the necessary width, e.g. scale 3" (0.033") + 0.020" = 0.055" for a zee bar for a single sheathed car with a 3" zee structural member
  - Abut the pieces with a steel straight edge and trim along the edge to create the strip. In this photo the strip is visible after trimming, still attached at the ends.

# Single Sheathed Cars The "Foundation"



# Single Sheathed Cars

## The first board

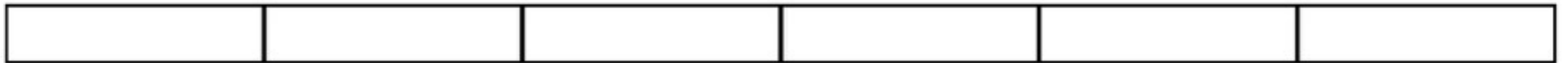
0.010" x 0.060" strip, nested on edge against side sill



# Single Sheathed Cars

## Texturing Sheathing Boards with Sandpaper

“Texture” the surface of several boards at once to keep them flat



“Texture” them one at a time will lead to rounded surfaces



- If you sand the surface of the boards to create surface texture, do them in groups laid out touching at the edges and drag sandpaper across all at once. When done, you can drop them like pickup sticks and select at random as you add to the side



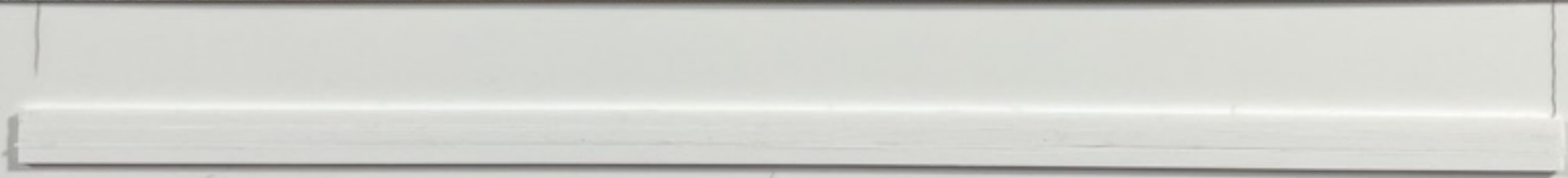
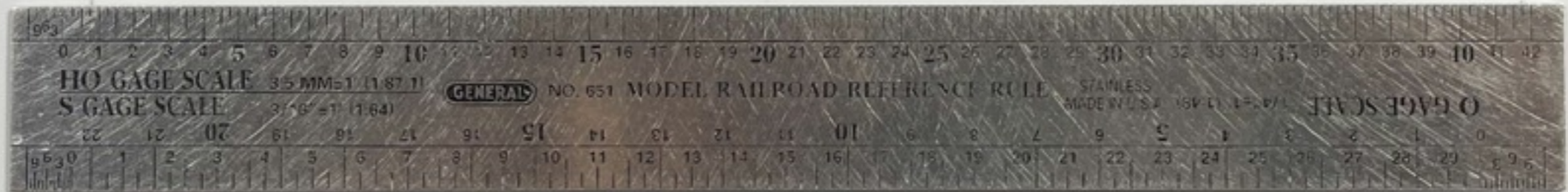
# Single Sheathed Cars

## The first "narrow" board



# Single Sheathed Cars

## Adding sheathing boards



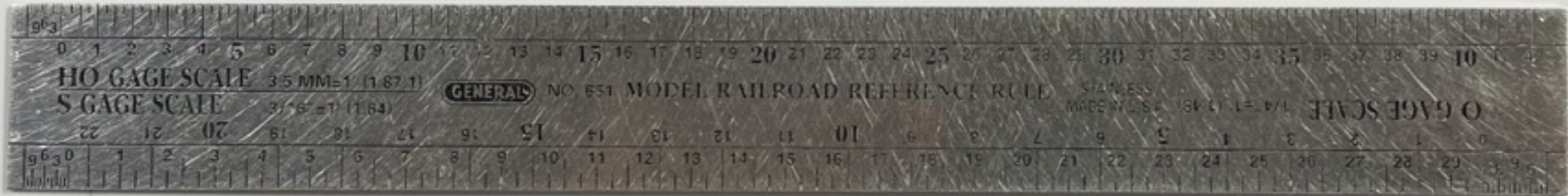
# Single Sheathed Cars

## Adding sheathing boards

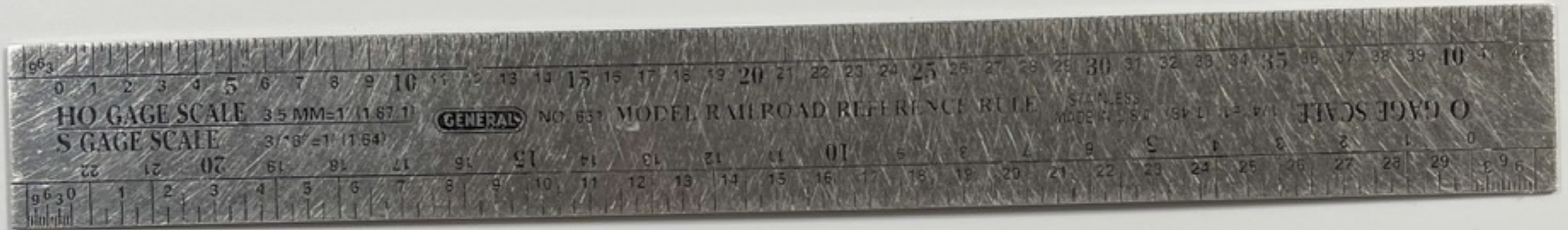


# Single Sheathed Cars

## Adding sheathing boards



# Single Sheathed Cars Adding sheathing boards



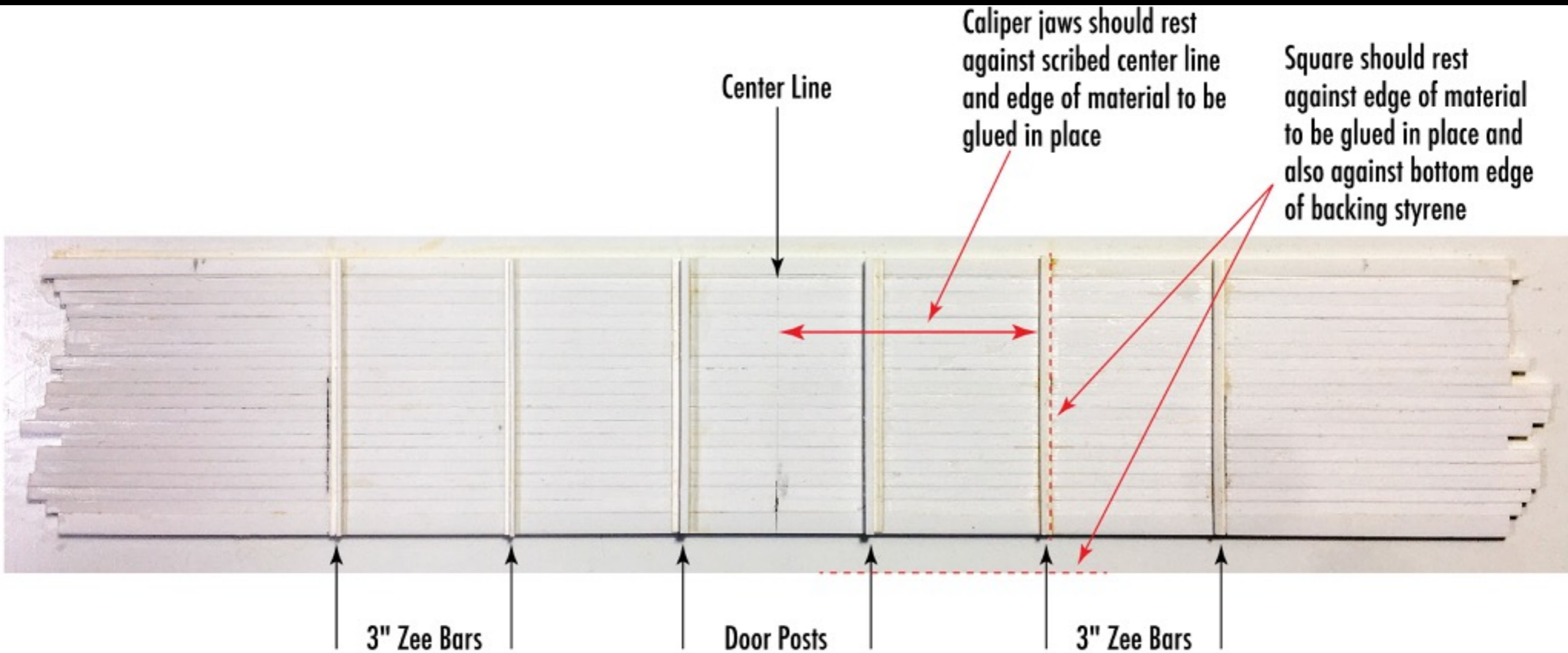
# Center Reference Line

Note randomness of board texturing



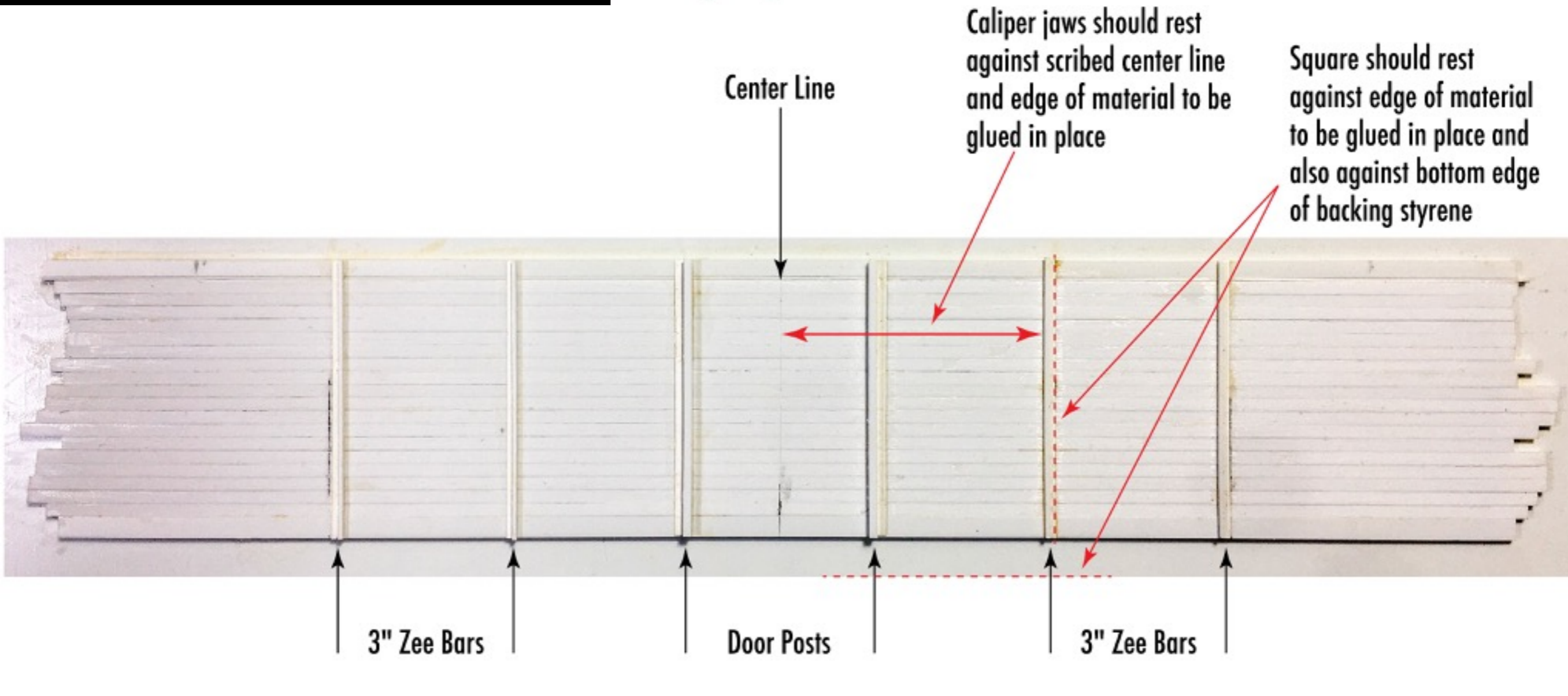
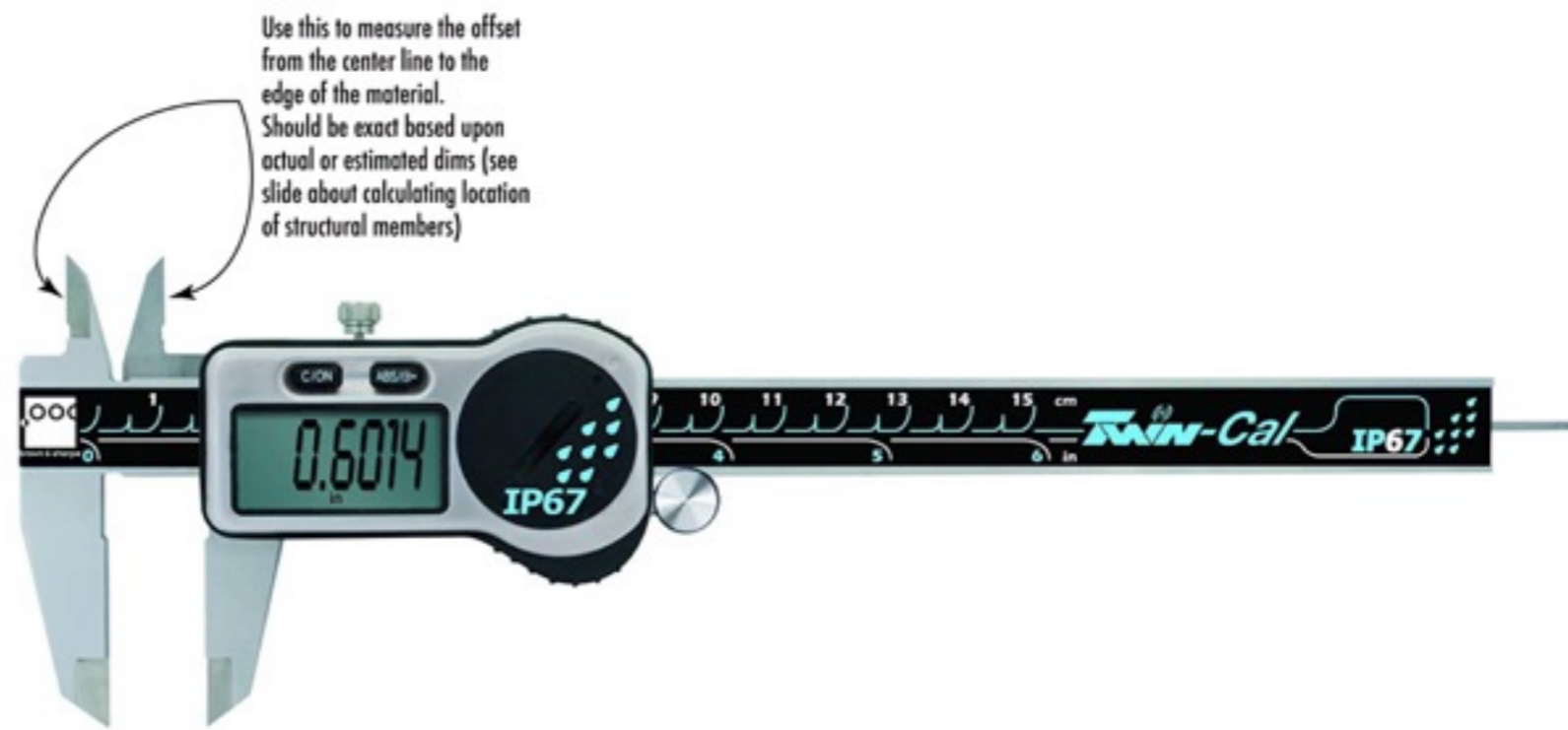
Scribed center line  
Point of caliper can use scribe line as a "nesting"  
point from which distances to structural members  
may be offset

# General Guidelines for Layout of Structural Members



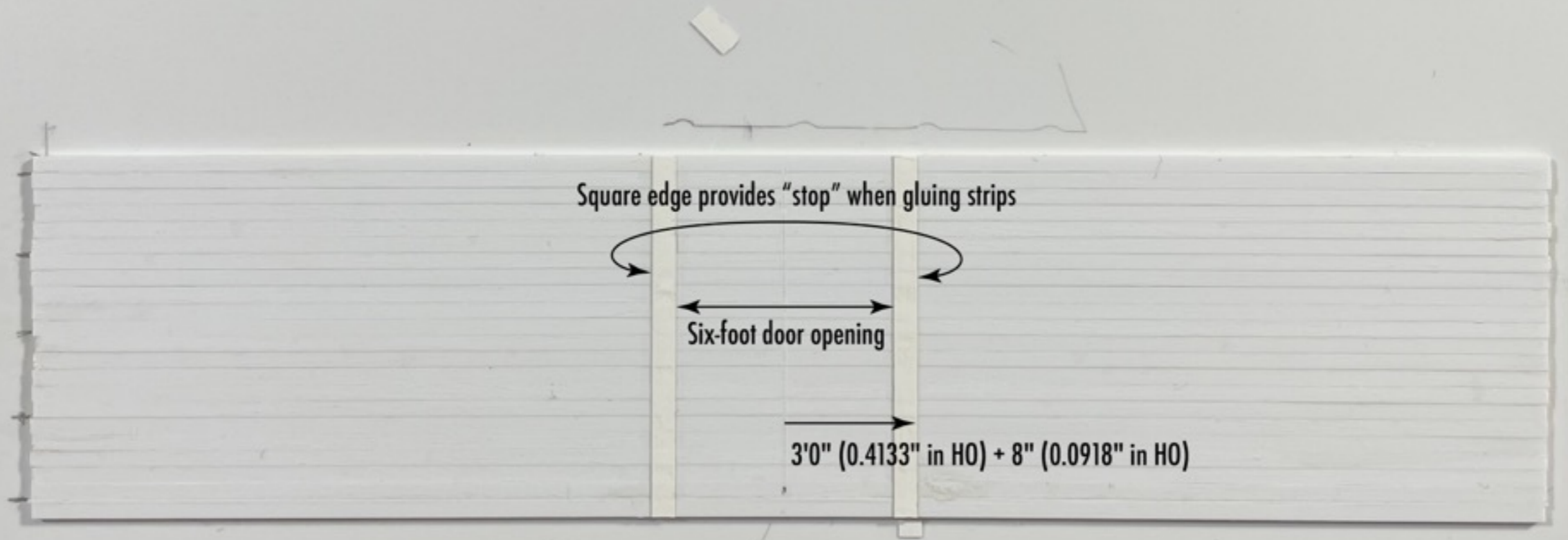
- I generally add the 0.005" strip ( $0.033" + 0.020"$  for a 3" zee bar) to the side first and then add the 0.020" x 0.020" followed by the 1" x 3", although you can also add an "assembled" zee straight to the side if that works for you

# General Guidelines for Layout of Structural Members



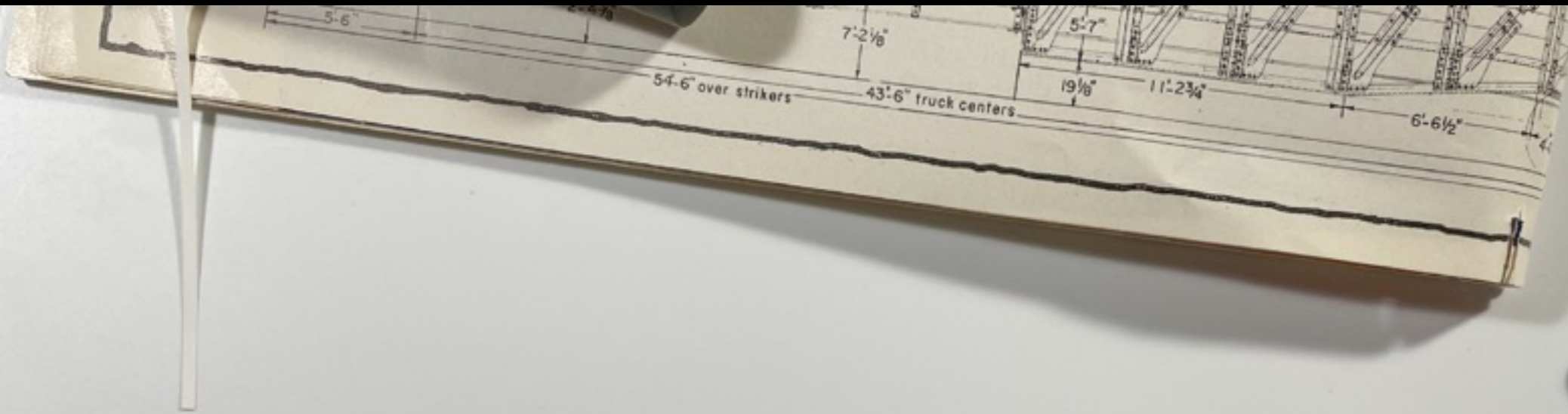


# Single Sheathed Cars Framing the door opening



Use the edge of the square to provide a “stop”; the edge of the square is set using the calipers, set to the correct distance from the center line of the car (0.5051" in this photo)

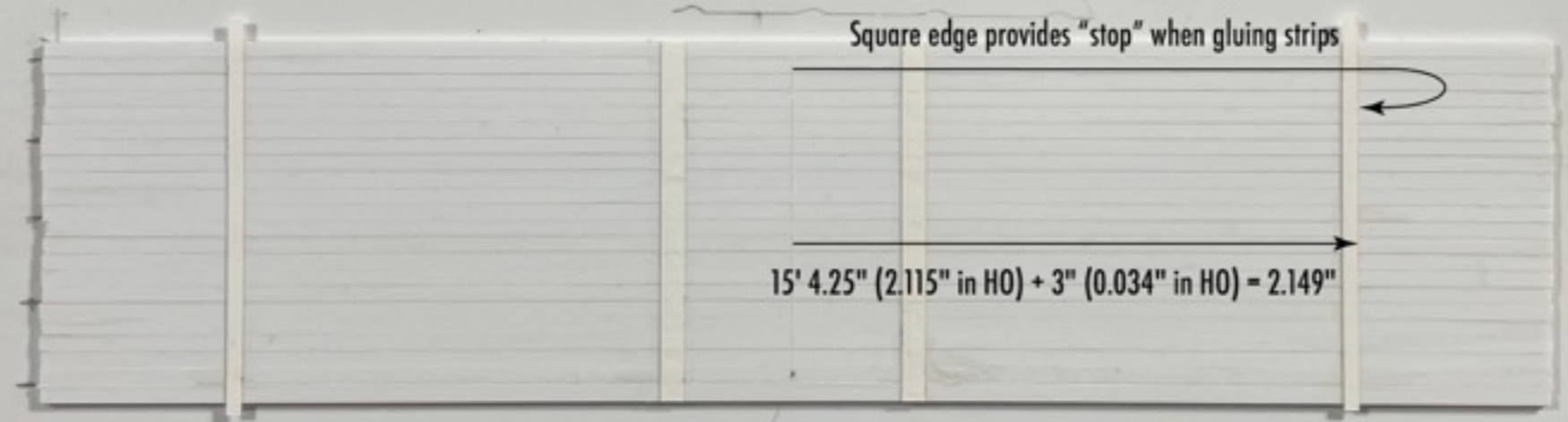
# Single Sheathed Cars Adding Vertical Structural Zees



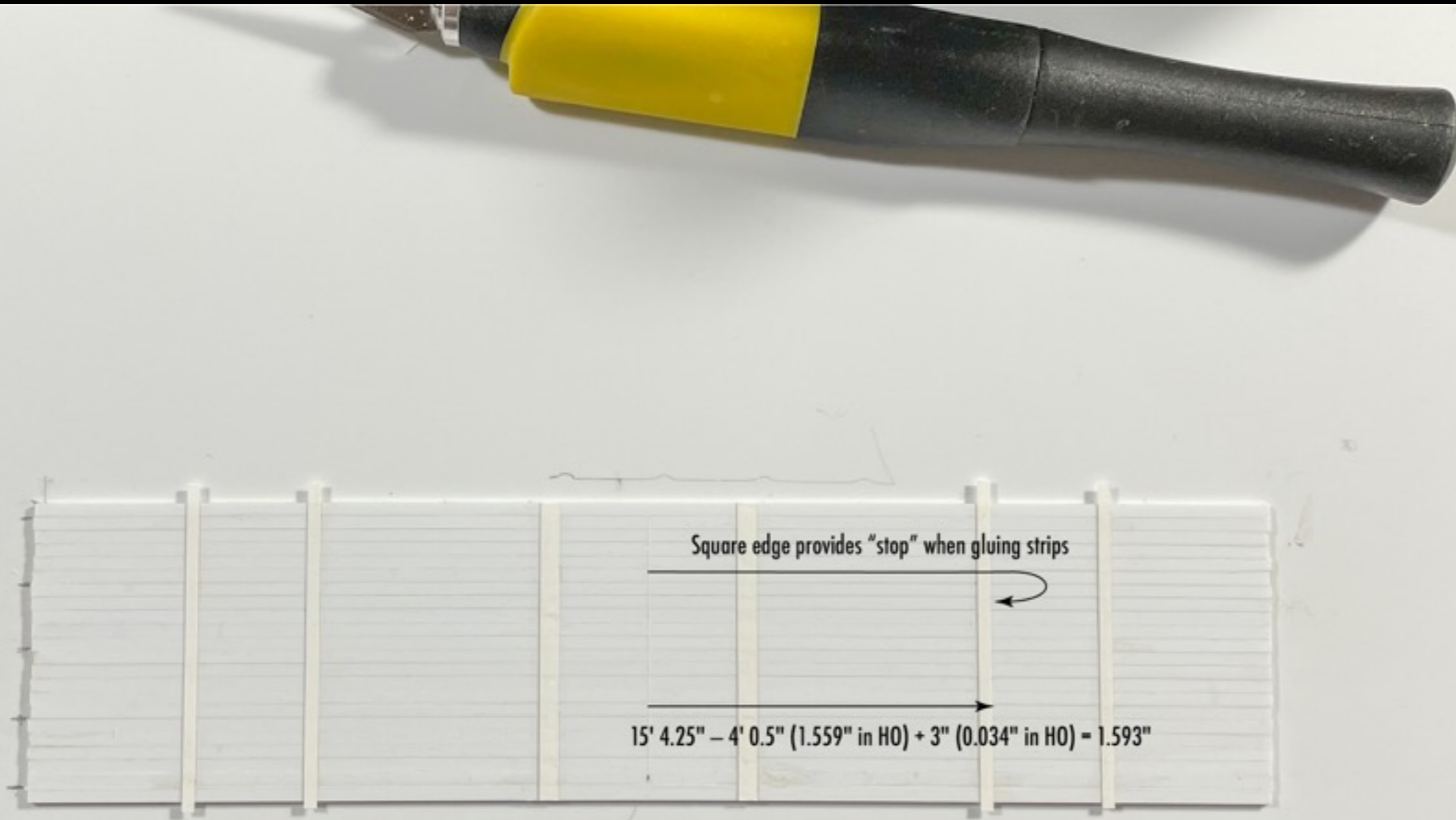
C/L to TC  
 $15' 4.25" = 184.25"$   
 $2.115"$   
 $+ .034"$   

---

 $2.149"$



# Single Sheathed Cars Adding Vertical Structural Zees



4133  
10459  
1040

C/L to TC  
 $15' 4.25'' = 184.25''$

2.115''  
+ .034''  

---

2.149''

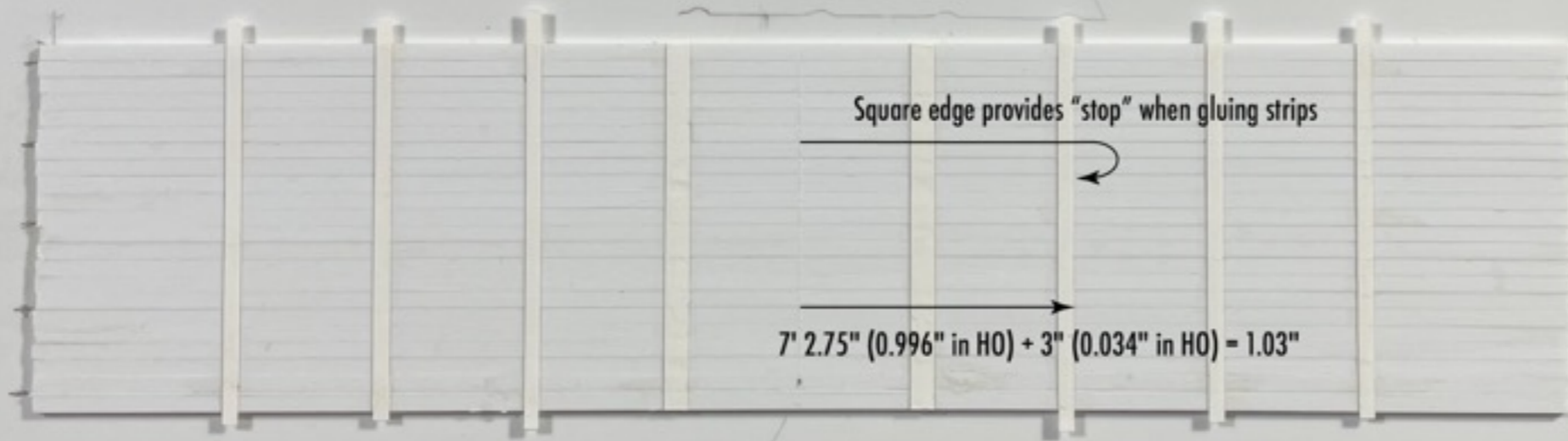
$15' 4.25'' - 4' 0.5'' =$   
 $184.25'' - 48.5'' = 135.75''$

1.559''  
+ .034''  

---

1.593''

# Single Sheathed Cars Adding Vertical Structural Zees



C/L to TC

$$15' 4.25" = 184.25"$$

$$\begin{array}{r} 2.115" \\ + .024" \\ \hline 2.149" \end{array}$$

$$15' 4.25" - 4' 0.5" =$$

$$184.25" - 48.5" = 135.75"$$

$$\begin{array}{r} 1.539" \\ + 1.034" \\ \hline 1.593" \end{array}$$

$$7' 2\frac{3}{4}" = 82.75"$$

$$\begin{array}{r} .996 \\ .034 \\ \hline 1.03 \end{array}$$

Single Sheathed Cars  
Adding Vertical Structural Zees  
The Perpendicular Portions from 20 thousandths square strip



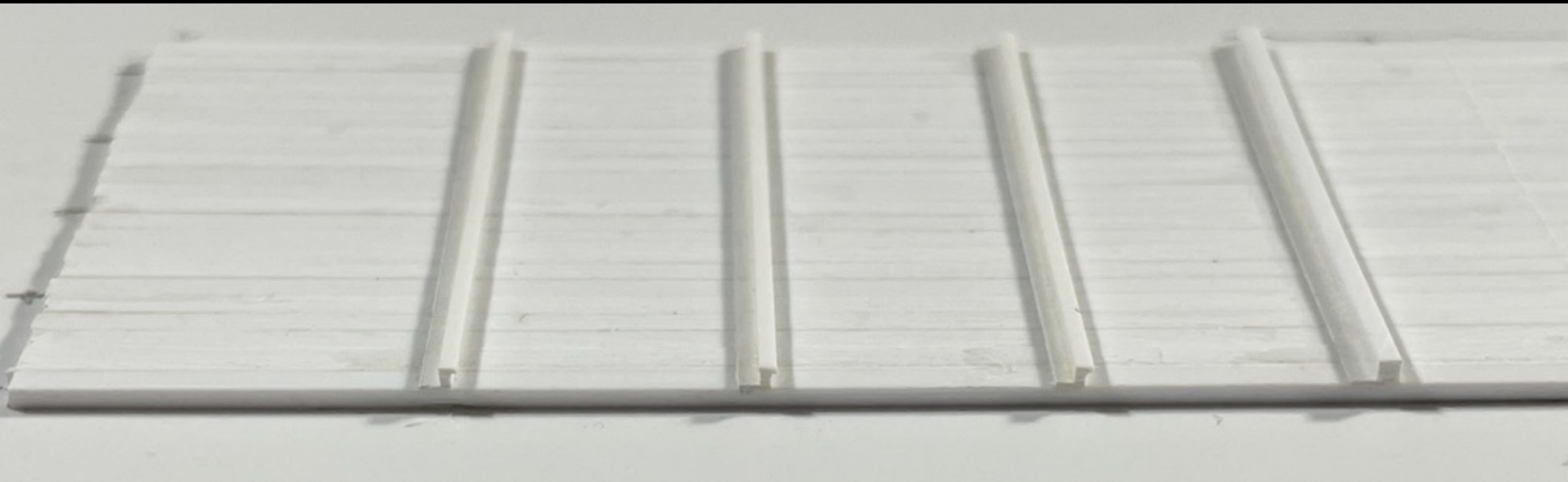
# Single Sheathed Cars

## Adding Vertical Structural Zees

### Top legs from 1x3 styrene strip



# Single Sheathed Cars Adding Vertical Structural Zees



# Single Sheathed Cars Adding Diagonal Structural Zees

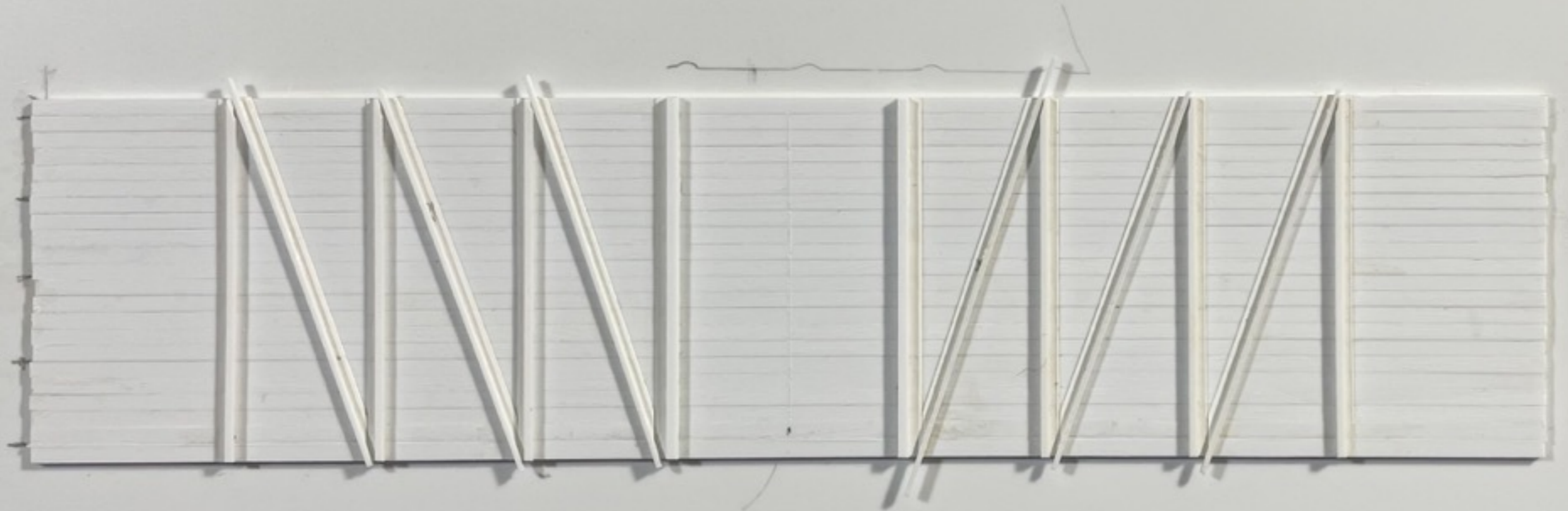




# Single Sheathed Cars Adding Diagonal Structural Zees



Single Sheathed Cars  
Adding Diagonal Structural Zees  
The Perpendicular Portions from 20 thousandths square strip



Single Sheathed Cars  
Adding Diagonal Structural Zees  
Top legs from 1x3 styrene strip



What's Left?



# What's Left?

- Carriage Bolts and Rivets - harvested from Athearn snow plow
- Diagonal straps
- Cleanup
- Castings
- Etchings
- The underframe (what?!)



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